Volpe National Transportation Systems Center

Cambridge, MA

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Volpe Center Highlights

Spotlight

As one of the leading transportation research centers, in the country, the Volpe Center always makes a strong showing at the Transportation Research Board's (TRB) annual conference. This year was no exception as numerous Volpe Center employees presented papers, chaired and attended committee meetings, and met with the 7,000 members of the transportation research and development community who attended. Many of the Volpe staff's activities are highlighted throughout this edition.

Volpe Center Participates in 78th Annual TRB Conference

The Volpe Center also hosted an exhibition booth to highlight the Center and its work. Featured at this year's booth were two demonstrations of ongoing Volpe Center efforts. The first presented the management information system developed by the Automation Technology Division for the U.S. Postal Service. The system, which is currently used by the U.S. Postal Service to support facility and environmental management for its 35,000 facilities nation-wide, attracted interest from numerous TRB attendees, including a number of federal and state agency officials.

The Volpe Center booth also included a demonstration of the Microscopic Traffic Simulator (MITSIM) co-developed by Dr. Haris Koutsopoulos, of the Office of Service Assessment Division, and Professor Moshe Ben-Akiva, director of the Intelligent Transportation Systems (ITS) Program at the Massachusetts Institute of Technology (MIT). MITSIM's simulation-based laboratory allows transportation planners to test, evaluate, and refine dynamic traffic management systems before implementation. The MITSIM model uses a graphical user interface to show the detailed movements of individual vehicles as well as the operations of traffic control and surveillance devices. This representation allows traffic management systems to be evaluated at the operational level and provides a rich set of calculations that can produce a variety of measures of effectiveness, such as travel times at various levels of detail. MITSIM is currently being used in several applications, including the testing, evaluation, and refinement of the traffic control system in Boston's Central Artery Tunnel project.

Director's Corner

Before we enter the new millennium, we must concern ourselves with the steps that we must take to renew and strengthen our Federal workforce. The Volpe Center--and indeed the entire Federal government--is in the midst of a major human resource transition. A large number of those in Federal leadership and critical technical positions are eligible for retirement. This, coupled with minimal hiring during the downsizing years, has created a sense of urgency around succession planning and Federal workforce renewal.

The Volpe Center is vigorously addressing workforce planning issues to ensure the future of the Center's Federal technical capability. As we face this pressing issue together, we must work to see that critical knowledge is transferred to our successors to ensure the continued viability and vitality of the Volpe Center. I have challenged the Center's leadership to commit to achieving this goal and am confident that they will rise to the occasion.

Over the course of the next five years, we will be faced with the challenge of recruiting and assimilating as many as 250 new Federal employees into our technical team. To meet the changing nature and demands of the 21st century marketplace, we will be hiring full time, permanent people.

Inside...

Safety

Promote public health and safety by working toward the elimination of transportation-related deaths, injuries, and

Volpe Center Participates in TRB Session on High Speed Rail Safety

Dr. Sherry Borener, of the Accident Prevention Division, presented a review of the Volpe developed Corridor Risk Assessment Model at a TRB session entitled, "Advances in High-Speed Rail Safety." The session focused on risk analysis methods and techniques for passenger and freight train operations. The Corridor Risk Assessment Model identifies cost-effective improvements for highway-railroad grade crossings on high-speed rail corridors by determining risk impacts of higher train speeds and the risk reduction benefits of alternative safety improvements at grade crossings. The session also included presentations on the Center's risk analysis of passenger train crashworthiness.

Volpe Staff Member Assumes Chairmanship of TRB Committee

Dr. Robert Dorer, of the High Speed Ground Transportation Division, assumed the Chairmanship of the TRB Committee on Guided Intercity Passenger Transportation. One of the topics for future work of the committee (in addition to TRB's principal focuses of information sharing and research need planning) will be to highlight the high degree of safety that already exists for this mode and to orient research needs development to rationalizing risk analysis across transportation modes. The Guided Intercity Passenger Transportation Committee is also working on a publication about the direction of the transportation field in the next century, which will be part of a major TRB publication for the new millennium.

Railroad Safety and Performance Research Presented

For over 25 years, the Volpe Center has been working with the Federal Railroad Administration (FRA) to improve railroad safety and performance, in part through research to better detect potential defects in rail structures. Rail equipment crashworthiness research conducted by Volpe's Structures and Dynamics Division has recommended strategies to improve crashworthiness and the application of analytic tools and test techniques to evaluate the effectiveness of those strategies. Messrs. John Choros, Brian Marquis, Andrew Sluz, David Tyrell, Herbert Weinstock, and John Zolock, all of the Structures and Dynamics Division, participated in various TRB sessions and workshops related to railroad safety and performance: Mr. Choros attended the meeting of the Committee on Railway Track Maintenance. Mr. Marquis gave a presentation to the Vehicle-Track Interaction, Part 1 Section entitled, "Modeling and Testing to Evaluate Low Speed Derailment Potential of Equalized Truck Designs" which summarized the simulation studies and measurements that have been made regarding the investigation of Low Speed Derailments in Sharp Turnouts. Mr. Sluz attended the annual meeting of the Committee on Rail Transit Design, of which he is a member. Messrs. Tyrell and Alan Bing of Arthur D. Little, Inc., presented a technical paper entitled, "Risk Assessment and Cost-Benefit Analysis of Rail Passenger Car Crashworthiness Improvements."

Mobility

Ensure that the transportation system is accessible, integrated and efficient, and offers flexibility of choices.

Volpe Staff Participate in Navigation Conference

The Global Positioning System (GPS) is the most accurate navigation aid currently available. Based on a constellation of 24 satellites orbiting approximately 11,000 miles above the earth, GPS receivers on aircraft, vehicles, or ships use radio signals emitted by the satellites to calculate their locations with great accuracy. However, the system has several limitations. The Volpe Center's Center for Navigation, has been working to ensure that navigation aids currently available are effective. Ms. Karen Van Dyke and Mr. James Carroll, of the Center for Navigation, participated in the Institute of Navigation's National Technical Meeting entitled, "Vision 2010: Present and Future" in San Diego, CA. The three-day conference covered a wide range of Global Positioning System (GPS) applications and focused on the integration of

navigation information in air, land, marine, and space systems. The meeting also covered issues pertaining to GPS integrity, Differential GPS navigation/communications integration, interference issues, and electronic charting. Additionally, Dr. Carroll presented a paper entitled "DGPS-Based Vessel Traffic Management at the Panama Canal" on behalf of the primary author, Mr. William Keepers, of the Panama Canal Commission. In a related effort, Ms. Van Dyke chaired a TRB session on DGPS Expansion and Augmentation.

Office of Research and Analysis Team Makes Three TRB Presentations (BTS)

Mr. Michael Rossetti, of the Office of Research and Analysis, and his team presented several projects at TRB. Mr. Rossetti presented "Classification System Changes" at the Data Developments in Transportation session. The talk showcased the North American Industrial Classification System (NAICS), which is replacing the U.S. Standard Industrial Classification (SIC) system and will reshape the way we view our changing economy. The NAICS was developed jointly by the U.S., Canada, and Mexico to provide new comparability in statistics about business activity across North America. The Volpe Center provided transportation expertise to this joint project of the U.S. Bureau of the Census, Statistics Canada, and Mexico's National Statistics, Geography and Informatics Institute (NEGI). Mr. Rossetti's talk helped kick-off the week of data programs at TRB.
In another session, the new data sources that were uncovered through Mr. Rossetti's National Transportation Indicators Project were presented in "Transportation Indicators from Data Developed for Other Purposes." Ms. Malinda Foy and Ms. Linda Sharpe, both of Cambridge Systematics, Inc., were joined by Dr. Basav Sen, of EG&G Services, to talk about transportation data that is regularly collected by the federal departments outside of the Department of Transportation. Sources that were described include: Bureau of Labor Statistics, the Bureau of Economic Analysis, the Bureau of Justice Statistics, the Energy Information Administration, and the Environmental Protection Agency. Dr. Sen also presented his and Mr. Rossetti's work on the Enhanced Transportation Weather Services (ETWS) initiative at a TRB Special Session, " Partnering for Technology Deployment." The ETWS initiative, sponsored by the White House's National Science and Technology Council (NSTC), promotes partnerships to increase the use of weather information for enhanced transportation safety and efficiency.

Economic Growth & Trade

Advance America's economic growth and competitiveness domestically and internationally through efficient and flexible transportation.

Implementing Emerging Technologies Discussed at TRB

Under the direction of Mr. Peter Manning, Transportation Strategic Planning and Analysis Division, a report entitled, "Public/Private Partnerships: Implications for Innovation in Transportation" was published and made available to TRB participants. The report provides an assessment of public/private partnerships, the challenges they face, and their potential for expediting innovation in the Nation's transportation system. The report includes examples that highlight activities in various modes of transportation and the lessons that can be learned. Dr. Aviva Brecher, of the Transportation Strategic Planning and Analysis Division, and Mr. Gary Ritter, of the Policy and Technology Assessment Division, disseminated the findings of the report along with the draft Volpe report, "The Surface Transportation Research and Technology Assessment", during their TRB presentation, "Deploying Emerging Technologies in Transportation: Pitfalls, Prospects and Promise." The presentation occurred during the session "Implementing Emerging Technologies: Lessons Learned", which was chaired by Dr. Brecher.

Volpe Staff Demonstrate Lease Information Management System (FAA)

The Federal Aviation Administration (FAA) is one of the major property acquisition and holding agencies in the federal government. It manages approximately 4,000 leases for facility land sites and buildings, as well as various easement and right-of-way real estate instruments. In addition, it owns real property valued at approximately $2 billion dollars. To support the FAA's management of these major assets, the Volpe Center is working with the FAA's Resource Division in the design, development, and deployment of the Lease Information Management System (LIMS). Ms. Phalla Keo, Mr. Robert Stouffer, and Ms. Diane White, of the Strategic Management Division, recently demonstrated the LIMS Prototype to Federal Aviation Administration (FAA) real estate and budget personnel. In addition to the demonstration of the prototype at FAA's Great Lakes Division in Chicago, IL, and to the FAA's Southern Division in Atlanta, GA, the staff acquired new lease documents to update the LIMS database and discussed alternative ways region personnel can supply new documents.

Human and Natural Environment

Protect and enhance communities and the natural environment affected by transportation.

Monitoring Customer Satisfaction

Ms. Marilyn Mullane, Chief of the Management Systems Division, provided updates of the Customer Satisfaction Monitoring System (CSMS) at the Volpe Senior Managers' meeting and the Management Team's meeting. Ms. Mullane's presentation included a status report on customer satisfaction interviews, results of the project-level interviews to-date, and an identification of the next steps in the process. With about 90% of scheduled project-level interviews completed, preliminary results show that four out of five project level customers said they came to Volpe, in part, because of the Center's "technical expertise" and "accessibility to quality staff." The survey also showed that 44% of project-level customers gave an overall satisfaction rating of either "9" or "10," on a scale where "0" means "extremely dissatisfied" and "10" means "extremely satisfied." These results are an improvement over the 1994-1995 round 1 survey which found that 29% of Volpe's project-level customers provided an overall rating of either "9" or "10".

Volpe Supports DOT Climate Change Task Force

For the transportation system, the safety, mobility, and economic impacts of adverse weather conditions are considerable. Moreover, the continued emission of greenhouse gases may lead to even more severe weather in the coming decades. As part of the Volpe Center's ongoing support to the U.S. Department of Transportation (DOT) on researching the impacts of weather on transportation safety, Mr. Kevin Green, of the Transportation Strategic Planning and Analysis Division, recently presented a draft report on climate change to the DOT Climate Change Task Force. A revised report will be submitted by the Task Force to the Deputy Secretary to support deliberations of the Department's Guiding Coalition in late February or March. This work is in conjunction with Mr. Green's position as Volpe Co-Executive Agent for the NSTC initiative on the Environment and Sustainable Communities.

Milestone Achieved in U.S. Army Watercraft Halon Replacement Program (USCG)

The Volpe Center has been providing ongoing technical and project management support to the U.S. Army Tank, Automotive, and Armament Command's (ATCOM), Transportation Systems Management Office, Watercraft Program Manager. One project in which the Volpe Center was involved was researching, developing, and implementing a suitable replacement for the current Halon 1301 fire extinguishing system. Several water mist systems and alternative gaseous agents were tested for effectiveness in engine rooms and flammable storage spaces through a cooperative effort with the United States Coast Guard (USCG), Naval Research Laboratory, Hughes Associates, Factory Mutual, and various industry manufacturers. Results of these various test initiatives provided adequate data to aid in selecting a suitable Halon alternative for Army watercraft retrofits. The chosen solution was to install FM-200™ (Hepta fluoropropane) total flooding, fire protection systems, coupled with additional water washdown systems (low pressure, fine spray, overhead deluge systems) for the purpose of overhead cooling and hydrogen fluoride gas removal.

Recently, a major milestone was met with the successful installation of four prototype FM-200™ systems. Extensive prototype testing was conducted to ensure the systems met safety and performance requirements. These included system functional testing and cold agent discharge tests in several critical spaces (main propulsion, thrusters, and electric generation). As a result of the testing, the equipment manufacturer, Kidde-Fenwal, and the Approval Authority, USCG, are re-designing and re-evaluating some of the system hardware to meet the required design parameters. Further work for the Volpe Center will include management oversight and acceptance testing on behalf of the USCG for production installations of approximately 60 additional watercraft worldwide.

Environmental Support Provided to the USPS

Through ongoing environmental work with the US Postal Services (USPS), the Volpe Center's Environmental Engineering Division currently supports the USPS Allegheny Area Asbestos Containing Building Material (ACBM) and Lead-Based Paint Projects. After assessing 250 sites in both Delaware and New Jersey to identify and locate ACBM and lead based paint, the Cen-

ter produced reports for each of the 250 sites surveyed. Those sites found to be contaminated were documented with an additional Operations & Maintenance section which served to inform the District Environmental Coordinator, the Postmaster, and postal personnel about the location of potentially hazardous materials and, where necessary, suggest appropriate action. Eighteen classes were recently held at three locations, so all Postal supervisory and maintenance personnel received training in asbestos and lead paint awareness. Two training sessions were video taped for future training of new USPS personnel. Additionally, warning labels were installed at all facility locations where asbestos or lead paint were present.

ITS Transit Management Course Presented at Virginia Tech (FHWA/JPO)

The Volpe Center provides ongoing support for the Professional Capacity Building (PCB) program of the Intelligent Transportation System (ITS) Joint Program Office. The PCB program was established to ensure that public transit, highway agency, and motor vehicle regulatory professionals have the necessary core competencies, as well as the knowledge, skills, and abilities to meet the challenges of deploying ITS as a key element of the 21st century's transportation system. As part of this effort, the Volpe Center's PCB team recently completed the first phase of a comprehensive training and education needs assessment. This effort confirmed that inadequate ITS professional capacity remains the largest non-technical barrier to the widespread deployment of ITS technologies in surface transportation. Moreover, the assessment identified the need to expand the definition of training to include such non-traditional methods as distance learning; technical assistance programs (such as scanning tours and the Peer-to Peer Program); and information dissemination programs. In support of the PCB Program, the Volpe Center developed a two-day course entitled "Transit Management Course." Recently, Ms. Sylvia Harris and Mr. Joseph LoVecchio, of the Telecommunications Division, directed and participated in the delivery of the "Transit Management Course" at Virginia Tech in Falls Church, VA.

Center Presents on Land Use and Transportation

As cities grow and the demand for transportation increases, changes in land use, traffic congestion, and air and water quality can be adverse. The Volpe Center, through its research on transportation and land use, has begun to identify key energy and environmental concerns. For example, the emissions caused by petroleum consumption contribute to both human health problems and global climate change. Cars, trucks, and other vehicles are major sources of carbon monoxide and of volatile organic compounds and nitrogen oxides— all precursors of ozone and acid rain. Highways have been blamed for erosive and contaminated runoff and the destruction of wetlands. These issues, combined with the dramatic forecasts for growth in world population and transportation demand, have given environmental and energy concerns prominence on the national agenda. As part of this effort, Mr. Don Pickrell, of the Office of System and Economic Assessment, presented a paper entitled, "Transportation and Land Use: How Strong is the Connection?" at the TRB session, "Land Use and Transportation."

TRB Presentation on Noise Measurement

The Volpe Center is supporting the FAA by providing measurement expertise on problems associated with aircraft noise and by developing and maintaining a computer model for airport noise prediction and analysis. The Center is also supporting the Federal Highway Administration (FHWA) by developing an improved highway noise prediction model. Staff from the Safety and Environmental Technology Division shared their work in this area at this year's TRB annual conference. Mr. Gregg Fleming chaired a TRB Committee on Transportation Related Noise and Vibration, Ms. Cynthia Lee, presented the paper entitled, "FHWA Highway Noise Barrier Design Manual," and Ms. Judith Rochat presented the video "Highway Traffic Acoustics."

Director's Corner Continued...

Moreover, we will put increased emphasis on term appointments, visiting professors, undergraduate and graduate co-op programs, gateway programs, and on exploring new sources of fresh talent. In our recruiting, we will stress the educational opportunities at the Center and our unique access to local universities. Recruitment goals will be an essential element of each supervisor's performance plan for the coming year.

We need to work toward a career resilient workforce —employees who are not only dedicated to the idea of continuous learning, but who are ready to reinvent themselves, to keep pace with change, to take responsibility for their own career management, and who are committed to enhancing the public good.

Richard R. Johnson